REVISED

No 51120

APPLICATION FOR PERMIT

TO APPROPRIATE THE PUBLIC WATERS OF THE STATE OF NEVADA

Date of filing in State Engineer's Office JUL 16 1987

Returned to applicant for correction

Corrected application filed

Map filed JUL 15 1987 under 51025

The applicant United States Department of the Interior, Bureau of Reclamation

P.O. Box 427 (Street and No. or P.O. Box No.), of Boulder City (City or Town),

Nevada 89005 (State and Zip Code No.), hereby make[s] application for permission to appropriate the public waters of the State of Nevada, as hereinafter stated. (If applicant is a corporation, give date and place of incorporation; if a copartnership or association, give names of members.) The Bureau of Reclamation is an agency of the Federal Government

1. The source of the proposed appropriation is Lower Virgin River: SW^4NW^4, Sec. 31, T. 15 S., R. 69 E., (Name of stream, lake, spring, underground or other source) M.D.B.M. (A SURFACE WATER SOURCE hydraulically connected to nearby pump test well VR-5).

2. The amount of water applied for is (1000 gpm) 2.228 second-feet (One second-foot equals 448.83 gals. per min.)

   (a) If stored in reservoir give number of acre-feet Not Applicable (Aquifer Testing)

3. The water to be used for exploration and evaluation of hydrogeologic properties of the Virgin River Valley (Irrigation, power, mining, manufacturing, domestic, or other use. Must limit to one use.) Aquifer

4. If use is for: (see description of this project on pp. 3-4).

   (a) Irrigation, state number of acres to be irrigated: N.A.

   (b) Stockwater, state number and kinds of animals to be watered: N.A.

   (c) Other use (describe fully under "No. 12. Remarks") Exploration and evaluation of aquifer

   (d) Power:

   (1) Horsepower developed N.A.

   (2) Point of return of water to stream N.A.

5. The water is to be diverted from its source at the following point: Pumped well VR-5 is located in the SW^4NW^4, sec. 31, T. 15 S., R. 69 E., M.D.B.M. N. (Describe as being within a 40-acre subdivision of public survey, and by course and distance to a section corner. If on unsurveyed land, it should be so stated.) 02 06'W. 10,730 feet from point I-288A in an unsurveyed area of the OVERTON SE QUADRANGLE, NEVADA - CLARK COUNTY, 7.5-MINUTE SERIES.

6. Place of use water pumped from drilled test well VR-5 will be returned to the Virgin River channel as shown on the inset of the accompanying map in the SW^4NW^4, sec. 31, T. 15 S., R. 69 E., M.D.B.M. (Describe by legal subdivision. If on unsurveyed land, it should be so stated.)

7. Use will begin about January 01 (Month and Day) and end about December 31 (Month and Day), of each year.

8. Description of proposed works. (Under the provisions of NRS 535.010 you may be required to submit plans and specifications of your diversion or storage works.) 10-inch drilled test well with slotted PVC casing, five monitoring wells, and pipeline to discharge in river channel nearby. (State manner in which water is to be diverted, i.e. diversion structure, ditches and flumes, drilled well with pump and motor, etc.)

9. Estimated cost of works $25,000

10. Estimated time required to construct works: Drilled test well VR-5 could be completed by June 30, 1988 (about 1 year). (If well completed, describe works.)

11. Estimated time required to complete the application of water to beneficial use: testing and monitoring of aquifer may extend for a maximum of five years

12. Remarks: For use other than irrigation or stock watering, state number and type of units to be served or annual consumptive use.

A. There will be no consumptive use during exploration of the aquifer as the pumped water will be returned to the Virgin River channel.

B. Waivers of certain well construction regulations to facilitate exploration of the Virgin River Valley fill aquifer are identified in Dick L. Williford's correspondence to Frank Di Sanza, Bureau of Reclamation, dated January 06, 1987 (copy attached, pp. 5-6)

By: s/ Dwight L. Sawyer, Jr.
Dwight L. Sawyer, Jr., Agent
State Water-Right Surveyor #781
Bureau of Reclamation, P.O. Box 427
Boulder City, NV 89005

Compared: pm/ se

Protested:

OF STATE ENGINEER

This is to certify that I have examined the foregoing application, and do hereby grant the same, subject to the following limitations and conditions:

The amount of water to be appropriated shall be limited to the amount which can be applied to beneficial use, and not to exceed cubic feet per second

Work must be prosecuted with reasonable diligence and be completed on or before

Proof of completion of work shall be filed before

Application of water to beneficial use shall be made on or before

Proof of the application of water to beneficial use shall be filed on or before

Map in support of proof of beneficial use shall be filed on or before

Completion of work filed

Proof of beneficial use filed

Cultural map filed

Certificate No. Issued

IN TESTIMONY WHEREOF, I, State Engineer of Nevada, have hereunto set my hand and the seal of my office, this day of, A.D. 19

State Engineer

218 (Rev.)

WITHDRAWN BY APPLICANT FEB 02 1994

STATE ENGINEER

Lower Virgin River Unit Project

SETTING

The Bureau of Reclamation (Bureau) is engaged in a program to control the salinity of the Colorado River and its tributaries. The Virgin River flowing into Lake mead is a substantial contributor of dissolved salts. Thus, the Bureau is studying the feasibility of a project to remove saline water from beneath the floodplain of the Virgin River, and pump it through an aqueduct to industrial consumers in Southern Nevada who can use poor quality water. This would provide an additional water supply for Southern Nevada beyond the compact amount from the Colorado River.

In order to determine the amount of water available and its average salinity, the Bureau must drill exploratory and monitoring wells at various locations along the Virgin River between the bridge at Riverside, Nevada and Lake Mead. These wells would be in, or adjacent to, the bed of the river and are essential for evaluating the hydraulic properties of the lower Virgin River aquifer.

Three sites for clusters of six exploratory wells have been selected and are shown on the enclosed maps. The exact number of wells to be drilled for the overall program is not known at the present time (time of filing). The total number will depend on pumping test results from the initial holes, funding, and ease of access to proposed sites. The best estimate at this time is that six wells would be drilled at each of the three sites - one ten-inch test well and five two-inch observation wells. Four of the five two-inch monitoring test wells would be symmetrically located on opposite sides of the pump test well. Initially, the ten-inch pump well would test the floodplain aquifer. At a later date, a deeper 10-inch well could be installed to evaluate the less permeable Muddy Creek Formation lying beneath the present valley fill (Virgin River floodplain). All wells would be cased with Schedule 40 PVC pipe, which would be factory slotted where screening is desired. The wells ending at the top of the Muddy Creek Formation would be screened from the 20-foot depth to the bottom. The wells penetrating the Muddy Creek Formation would be screened in the Muddy Creek Formation only.

Available information about the river indicates that it flows and meanders across the surface of the lower Virgin River Valley on top of a body of valley fill that increases in width proceeding downstream to roughly a mile, and that is approximately 100 feet deep at its deepest point. The

valley is incised into the Muddy Creek Formation, which is relatively impermeable, further supporting the conceptualization that the sediments under the river comprise a closed aquifer.

The sedimentary valley fill comprises an aquifer which has hydraulic continuity with the river, and whose water is generally considered to be a component of the flow of the Virgin River. However, because of concentration through vegetative water use and evaporation during low, or no flow periods, the near subsurface water contains several times the concentration of dissolved salts contained in the river water. Data available shows that the predominant salinity is roughly 3,000 mg/L, and that localized concentrations are as high as 10,000 mg/L. Because the surface of the river bed is frequently dry during late summer, two applications for the appropriation of water are being filed: one, for surface water, and the other, for ground-water.

Initially, applications to appropriate were filed in 1986 and are on file for the same three locations of current interest at which exploratory wells will be drilled and pump is proposed. Serial numbers assigned to these applications are 50175, 50176, and 50177. Although extensions of time were not filed, the Division of Water Resources was notified of the Bureau's continuing interest in these three locations.